MATERIAL RECOVERY FACILITY PILOT PROGRAM

Flexible Packaging

October 15, 2018

23rd Annual RAM/SWANA Conference
1. Our 501(c)3 Organization and Vision
2. Why This Work is Important Now
3. Research and Pilot Planning
4. 2018 Pilot Launch
What if an economically viable and nationally scalable solution could be developed to recycle flexible packaging?
MRFF Members

Administered by:
Foundation For Chemistry Research & Initiatives
OUR VISION

Flexible packaging is recycled curbside, and the recovery community captures value from it.
OUR APPROACH: VALUE CHAIN COLLABORATION TO ACCELERATE THE SOLUTION

- Customer requirements for local recycled feedstock
- Higher contamination
- Shifting cost model
- Green fence

- Waste burdens on public resources
- Inconsistent State/local policy
- Concerns for litter and marine debris

- Zero waste and Sustainable Development (SDG) goals
- Customer requirements
- NGO pressures

- Zero waste goals
- Value recyclability
- Supplier requirements for more sustainable products
- Reputation risk

- Buy products consistent with values
- Desire to be environmentally responsible
- Confused about what is recyclable
Why Recycling Flexible Packaging is Important Today
We don’t want **landfills to be excavated** in 50 years and our flexible plastic bags, bearing **our company’s name**, show up as “permanent branded litter”… the problem is bigger than one company, so **it makes sense to work in a research collaboration.**
THE NEW PLASTICS ECONOMY: RETHINKING THE FUTURE OF PLASTICS

• Current collection strategies need much help
  • 1.1 million tons of flexible packaging waste projected by 2020
  • Store drop off collection recycles only 4%

• Materials Recovery for the Future:
  • A potential MRF solution to achieve recycling at scale
  • Proved technology exists to sort at MRF
  • Proved economic feasibility for hot spot regions
  • Will boost community recycling rates beyond 34% by adding automatic, positive sort capacity for flexible packaging
CONSUMERS WANT PACKAGING THAT CAN BE RECYCLED ACROSS A RANGE OF CATEGORIES

% consumers indicating “recyclable packaging” is very/somewhat important to their purchase of the following types of products

- Household cleaning: 80%
- Personal care: 73%
- Food and beverage: 73%

* Source: Natural Marketing Institute research
About 1 out of every 2 consumers are interested in learning more about what companies are doing to...

- Use more **recycled contents** in their products and **packaging** (46%)
- Use **less packaging** (45%)
- Reduce the amount of **trash** and other **waste** they produce (51%)

Companies have an opportunity to build strong brand loyalty with interested customers that want to see more environmentally-friendly packaging practices.

* Source: Natural Marketing Institute research
THE PACKAGING STREAM HAS EVOLVED

2012 (compared to 1990 Baseline)

Data from RRS recycle.com

**Decreasing Prevalence ↓**
- Newspaper (-7%)
- Glass Containers (-3%)
- Steel Containers (-1%)
- Total Other Paper Nondurable Goods (-1%)
- Other Paper & Paperboard Packaging (-0.1%)
- Aluminum Containers (-0.1%)

**Increasing Prevalence ↑**
- Aluminum Foil, Closures, etc. (0.1%)
- HDPE Natural Bottles (0.1%)
- Other Plastic Containers (0.1%)
- Plastic Bags, Sacks, & Wraps (1%)
- PET Bottles & Jars (2%)
- Other Plastic Packaging (3%)
- Corrugated Containers (5%)
Flexible packaging is showing up at Material Recovery Facilities (MRFs) from curbside recycling streams in increasing quantities.

Flows with paper in a MRF and negatively affects bale quality and value.

Turn a negative impact into a positive outcome by upgrading MRFs to sort, bale & sell flexible bales:
- Reduces QC labor costs for pickers
- Increases quality of paper bales
- Creates new source of revenue with flexibles bale
- Eliminates landfill disposal cost of flexibles
PREVIOUS MRFF RESEARCH RESULTS: AUTOMATED MRF SORTING OF FLEXIBLE PACKAGING IS TECHNICALLY FEASIBLE

- Equipment Testing — 5 manufacturers
- MRF Testing — 3 facilities
INITIAL RESEARCH POINTS THE WAY TO RECYCLE FLEXIBLE PACKAGING AT SCALE

• As a 2-dimensional package, flexible packaging flows with fiber in a recycling facility
• Placing optical sorters on MRF fiber lines has potential to effectively sort flexible packaging from fiber at scale
Airflow control over acceleration conveyor and in collection hood plays a major role in successfully sorting flexible packaging from paper.
FLEXIBLE PACKAGING CATEGORIES

- Bags (excludes retail, storage and trash bags) 16.5%
- Cut/wrap 2.2%
- Flow Wrap 0.7%
- Lay flat/Pillow pouches 42.0%
- Standup pouches 12.0%
- Shrink bundling 2.7%
- Retort pouches 0.2%
- Retail carry bags 16.0%
- Storage bags 7.7%
ESTIMATED FLEXIBLE PACKAGING MIX - RESIN CHARACTERIZATION

- LDPE: 49.1%
- HDPE: 19.0%
- OPET: 18.4%
- OPP: 11.5%
- WOPP: 0.6%
- Foil: 1.2%
- PP: 0.1%
- Paper: 0.1%
- PP: 0.1%
- LDPE: 49.1%
FLEXIBLE PACKAGING SORTATION AT MATERIALS RECOVERY FACILITIES

Research Report
Demonstrate flexible packaging recycling with a partner at a community MRF, with a plan to sort both PE and other flexibles; and, expecting our MRF partner will require equipment modifications and testing—perform lab tests as necessary in support of MRF implementation.

2017 WORK STREAMS

- End Market Assessment
- Identify Community MRF Pilot
- Equipment Testing
- Communications and Recycling Industry Engagement
RESEARCHED CURRENT AND FUTURE END MARKETS

2015

POST-COMMERCIAL (989 M lbs.)

POST-CONSUMER (209 M lbs.)

Retail bags & films and MRF curbside film

Pilot & 10yr Projection

6 M lbs/yr

No fiber
PE only

SORTING
WASHING
SHREDDING

No fiber

SORTING
WASHING
SHREDDING

Film/Sheet
Lumber/ Extruded profiles
Durable Products, Intermediates - pellets (EcoStrate, Ultra Poly)
Pyrolysis
Engineered Fuel Pellets
Cement Kilns
Bldng Products (ReWall)

• Pilot will show that adding flexibles can be cost-neutral or better for the MRF

• Economic feasibility modeling of net system costs verified pilot MRF’s costs and benefits to add flexibles are within reason

• Communities that want to recycle more will find addition of flexible packaging to curbside very attractive
PILOT LAUNCHED IN 2018

- Highly qualified MRF owner (TotalRecycle/ J.P. Mascaro & Sons) with state of the art recycling facility has been recruited as Pilot partner
- Van Dyk selected (via RFP) as the equipment supplier to upgrade pilot MRF and sort flexible packaging into rFlex bale
- Material will be circulated internally until performance specs met to phase in collection in 90+ communities served by Total Recycle
KEY POINTS FOR CONSIDERATION

• MRFF offers an open, scientific collaborative process that will improve the quality of single stream—cleaning up paper while producing the new rFlex product bale

• We realize markets are critical and are working this as part of the pilot, including creating stronger demand pull necessary for end market success

• Pilot is robust and will prove that technology and recycling markets are there to justify net system cost of MRF upgrade

• Continued collaboration between recycling industry and upstream producers, manufacturers, converters and brands is key. Strong trade association participation reinforces this collaboration
## MRFF: PILOT TIMELINE 2018 - 2019

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**Key Milestones:**
- **Startup:** Jan 2019
- **Turnover:** Feb 2019
- **Member Meeting:** Mar 2019
- **Project Completion**

**Engagements:**
- WBCSD Oct 2018
- NERC Webinar Nov 2018
- Plastics Recycling Mar 2019
Determining Material, Environmental, and Economic Efficiency of Sorting and Recycling Mixed Flexible Packaging and Plastic Wrap

Project Goals

• Develop a data collection method and process model for a material recovery facility (MRF) producing rFlex.
• Life-cycle inventory research of model process unit data that describes selected process pathways for rFlex bales to: plastic pellets, wallboard, durable goods and film.
• Integration of MRF model with selected process pathways using System Dynamics.
BECOME PART OF THE SOLUTION

- 2018 MRF Recycling Pilot
- 1st opportunity in the U.S. for communities to recycle flexible packaging (pouches, bags and film wraps) in their curbside cart
- Include your branded flexible packaging in the program

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